Waupaca River Bridge
(Mill Street Bridge)
Spanning Waupaca River on Mill Street
City of Waupaca
Waupaca County
Wisconsin

HAER No. WI-70

HAER
WIS
66-WAUP.
2-

PHOTOCRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Rocky Mountain Regional Office
National Park Service
P.O. Box 25287
Denver, Colorado 80225-0287

HAER NO. WI-70

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HISTORIC AMERICAN ENGINEERING RECORD

WAUPACA RIVER BRIDGE
(Mill Street Bridge)

Location: Mill Street over the Waupaca River
City of Waupaca, Waupaca County, Wisconsin

USGS Waupaca Quadrangle, Universal Transverse Mercator Coordinates:
Zone 16 Easting 333985 Northing 4913800

Present Owner: County of Waupaca

Present Use: Vehicular bridge

Significance: The Waupaca River Bridge is a six-arch, granite structure that was built in 1891. Waupaca County is among those Wisconsin counties unique for the number of stone-arch bridges they once had. Of the eleven remaining bridges identified in Waupaca County by the 1986 publication Historic Highway Bridges in Wisconsin, Volume 1: Stone and Concrete Arch Bridges, this structure is unique in the city and county as the one with the most spans and the greatest length.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: 1891[1]

2. Architect: Unknown

3. Original and subsequent owners: Public ownership.

4. Builders, suppliers:

   A. Builders: Mads. Rasmussen[2]

   B. Suppliers: Unknown

5. Alterations and additions: Although the form of the bridge is generally good, its architectural character has been substantially altered, and its integrity substantially diminished, through the application of gunite on all surfaces but the segmental arches themselves.

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[1]Stone-Arch Bridge Intensive Survey Form (Bridge #P-68-709), Department of Transportation, Madison, Wisconsin.

[2]Ibid. "Mads." is often an abbreviated version of Madison.

B. Historical Context:

GENERAL HISTORY OF THE CITY OF WAUPACA

The first Euro-American settlers in what was to become the City of Waupaca were E.C. Sessions, Joseph Hibbard, William Hibbard, William Cooper and J.M. Vaughn, all of whom arrived in June 1849. Undeterred by the region's untamed wilderness and its lack of promise for immediate wealth, these men were attracted to the recently ceded Menominee Indian lands by the "pale water" falls on the Waupaca River and the potential for power development they offered. Sessions and the two Hibbards staked their claims at the falls and eventually brought their families to join them. William Cooper, a lawyer, and his wife, the first white woman to settle in the present-day city of Waupaca, built the first house in the area in August 1849. John Vaughn, on the other hand, was among the first of many aspiring agriculturalists in the vicinity and was soon regarded as an extremely able farmer.[3]

While necessity and abundant, productive land essentially established Waupaca's farming community, the river fueled the beginnings of its industrial development. Silas Miller was one of the first persons to take advantage of the water power when he opened a sawmill in September 1850. In 1851, W. C. Lord bought Miller's site, after which he and Wilson Holt established the community's first gristmill, the Waupaca Star Mill. No longer did the nearly one hundred residents of Waupaca have to make about a seventy-mile round trip over land and through the marshes to obtain flour from the nearest mill in Ripon.[4]

Industrial growth continued, several examples of which supported the region's logging activity. C. H. Allen established the Eagle Planing Mill in the early 1850s, a company which John Jardine assumed control of in 1865. At about the same time, S. R. Sherwin and George W. Taggart opened a sawmill that evolved into a planing mill. Another development included J. W. Evans and his 1866 conversion of the City Grist Mills into what became known as the Waupaca Woolen Mills -- the most significant industry in the area for years. One of the last industrial developments of the pre-railroad era was the establishment of John Rosche's Pioneer Foundry in 1871.[5]

Retail stores were also increasingly prevalent throughout the 1850s and were evidence of the community's growing agricultural and industrial support role.

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[3]John M. Ware, ed., A Standard History of Waupaca County Wisconsin, vol. 1 (Chicago: The Lewis Publishing Company, 1917), 206-210, 213, 217, 252, 255, 392; J. Wakefield, History of Waupaca County, Wisconsin (Waupaca, WI: D. L. Stinchfield, 1890), 186-87.

[4]Wakefield, History of Waupaca County, 187; Ware, A Standard History of Waupaca County, 211, 213-215, 217; Polly Athan, Technological Watersheds on the Waupaca River: A History of the Fisher-Fallgatter Mill (Madison: State Historical Society of Wisconsin & University of Wisconsin-Milwaukee, [1979]), 22.

[5]Ware, A Standard History of Waupaca County, 248-50, 253.

Among those retailers were James A. Chesley, who began operating a drug store in 1853, and P.A. Chesley, who offered residents Waupaca's first line of tinware and hardware which had been brought in from Milwaukee in 1855. As well, P.R. Roberts opened a general store in 1856. In addition to agricultural and industrial support, this growing trade very likely benefitted from the fact that the town served as "the gateway of much of the supply trade for the adjacent pineries."[6]

Likely due to this modest growth, the county board organized the town of Waupaca on 5 March 1852 as one of six divisions within the county. And in 1857, Waupaca was incorporated as a village. Despite these administrative developments, the village remained "a frontier settlement" until the arrival of the railroad in 1872.[7]

When the Wisconsin Central and Green Bay & Minnesota railroads entered Waupaca in the early 1870s, relative prosperity was on board for the village. Railroad transportation transformed the frontier settlement into an agricultural marketplace. As a contemporary noted: "Waupaca's chief business interest--the one upon which all others are in the greatest measure dependent--is the buying and shipping of farm produce."[8] Farm goods produced in and shipped from Waupaca included corn, wheat, oats, hops, barley and rye. Because of the new transportation facilities, dairy products from throughout the county wound up in Waupaca, thus helping the town develop a successful dairy and creamery trade. Another agricultural venture developing in the community at that time was livestock breeding. John M. Ware, for instance, began raising livestock for shipment on his father's farm. He eventually pursued this business with William Dayton through a company known as Ware & Dayton.[9]

Although Waupaca handled a diversity of agricultural products, its main export was potatoes. In 1872, P.J. Nordeen was the first to capitalize on this new trade. The quality and quantity of potatoes in the Waupaca area were said to be unsurpassed throughout the world. Indeed, whereas yields of three hundred bushels per acre were quite common, there had been as many as six hundred bushels produced from one acre around Waupaca. Moreover, these astounding yields did not drive down the price. Averaging forty cents per bushel, Waupaca potatoes consistently secured higher prices than those of the strongest competitors from Michigan. This prosperous potato trade resulted in the shipment of 500,000 bushels in 1887-1888; Chicago was often the destination though Waupaca shipped considerable amounts to St. Louis. By the turn of the century, the town was noted as

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[6]Ibid., 230, 247. This is a reference to logging operations in the nearby forests.

[7]Ibid., 215, 230, 391-92; Wakefield, History of Waupaca County, 187-88.

[8]D. L. Stinchfield cited in Ware, A Standard History of Waupaca County, 250.

[9]Ibid., 210, 230-31, 251.

being in the "center of the great Wisconsin Potato belt, the shipments during the [1902] season from here being over one million bushels."[10]

In the midst of this trade boom, Waupaca expanded in many ways: it was incorporated as a city in 1875; its population had nearly doubled in ten years, reaching 2,127 by 1890; and its industrial base escalated. After the new City Mills burned in 1883, one of the owners, M.R. Baldwin, joined with R. Bailey and leased what became known as the Waupaca Star Roller Mills in 1884. S.T. Oborn, another former proprietor of the City Mills, collaborated with R.N. Roberts and established the Crescent Roller Mills in September 1884. The Crescent Mill was renamed the Waupaca Roller Mills after J. C. Eilertson purchased it in June 1901. The mill changed hands several times until Fred Fisher and Ward Fallgatter assumed control in 1905. The mill was eventually named after these proprietors and became a substantial operation with a national market.[11]

Other new industry also came to Waupaca. A.W. Hollenbeck created the Waupaca Bottling Works in June 1887. This operation tapped the water power of the nearby Crystal River. A year later, the A.G. Nelson Company expanded operations around the former Sherwin-Taggart Planing Mill. Utilizing the railroad, this business, which was incorporated in 1901, handled lumber and coal. And, with the erection of a gristmill in 1900, it even handled grain. Another lumber-related industry was the Central Lumber Company. Established in 1902, it was the successor to the Eagle Planing Mill and manufactured many items including sashes, window frames, cabinets and desks.[12]

Throughout the twentieth century, Waupaca was also becoming a "popular summer resort" area. Soon the town came to be more famous for its location in the "Chain of Lakes" resort area than its more mundane role as an agricultural support and industrial community.[13] Serving as a local trade and industrial center, however, is a role the city continues to play in the twentieth century. Indeed, the commercial and industrial developments of the late nineteenth and early twentieth centuries transformed Waupaca into a community of great significance in the county.

It was in this general context, providing access across the Waupaca River, that the Waupaca River, stone-arch bridge existed.

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[10]Ibid., 249-51; Polk's Wisconsin State Gazetteer & Business Directory, 1901-1902 (Chicago: R.L. Polk & Company, 1901), 1109.

[11]Ware, A Standard History of Waupaca County, 231,250; Athan, Technological Watersheds, 24, 30-33.

[12]Ware, A Standard History of Waupaca County, 250, 253-254.

[13]Wisconsin State Gazetteer, 1901-1902, 1109.

STONE-ARCH BRIDGES

Historian David Plowden has observed that the construction of stone-arch bridges was not popular in the United States because it was economically unfeasible and construction was too time consuming. Plowden noted, "With few exceptions, impatient America [did not] take the time to lay up a stone bridge where an alternative was available."[14] Contrary to historical consensus, however, stone-arch bridges in Wisconsin were not uncommon in the early twentieth century. In a 1986 study conducted by the Wisconsin Department of Transportation, forty-nine stone-arch bridges were identified in the state, about one-half of which are found in northeastern Wisconsin. The bridges were grouped into three categories: railroad, country and city. This discussion, however, focuses on the latter two types. To understand why stone-arch bridges were more prevalent than historians suggest, it is useful to examine the conditions that facilitated their construction.[15]

A primary reason stone-arches were built in Wisconsin was the abundant supply of the four basic types of building stone: limestone, fieldstone, sandstone and granite quarry. A particular bridge's building material would "conform to their local bedrock conditions." For example, surviving quarried granite bridges are located in Lincoln and Waupaca Counties, while sandstone bridges are found in Monroe and Grant Counties and fieldstone structures exist in the Wisconsin "Drift" Area, especially in Price and Waupaca Counties. The most common building material was limestone, found in the eastern quarter of the state. In order to keep costs down, bridge builders obtained these abundant natural resources which were supplied by the hundreds of local quarries throughout the state. In fact, it has been noted that it was possible "in almost every instance, to identify a quarry site within five miles of a Wisconsin stone-arch bridge."[16] Because of the large number of quarries, stone-arch bridge construction was much more frequent than existing evidence suggests. It is unknown exactly how many of this type were constructed statewide, but in Outagamie County, of thirty-five stone-arch bridges built between 1898 and 1910, only nine remain. This example illustrates that "longevity has never been a strong point for the state's stone-arch bridge population."[17] Building methods generally accounted for this attrition rate, especially among country bridges.

Thirty-three of the forty-nine bridges in the study were categorized as "country bridges." These structures were built by residents of small towns

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[14]David Plowden, Bridges: The Spans of North America (New York: The Viking Press, 1974), 9, 32, cited in Jeffrey A. Hess and Robert M. Frame III, Historic Highway Bridges in Wisconsin, Volume 1: Stone and Concrete Arch Bridges (Madison: Wisconsin Department of Transportation, 1986), 13.

[15]Hess and Frame, Historic Highway Bridges in Wisconsin, 6, 13-15, 21-22.

[16]Ibid., 15-21.

[17]Ibid., 21.

or villages, generally between 1900 and 1913. They stand in ten Wisconsin counties, but the majority can be found in Outagamie, Price and Waupaca Counties. Most are located on farm roads, and thus are noted more for their functional rather than their aesthetic qualities. The basic features of country bridges include "rock-faced, rubble masonry construction with mortar joints..., one or two segmental arches averaging about 18 feet in span..., stone or simple metal railings, and an overall, structure width of about twenty feet."[18]

Construction, design and quality varied from bridge to bridge and county to county. The regional variations can be classified as the fieldstone bridges of Price County, the fieldstone bridges of Waupaca County and the limestone bridges of Brown, Calumet, Fond du Lac and Outagamie Counties. Many of the Price County fieldstone bridges exhibited low quality, since only six of several dozen structures survive. Built by people who had little or no engineering training, many of these bridges suffered from erosion or "scour" because the arch foundations were not deep enough. Most of the bridges had a massive, block-like appearance that resulted from the use of roughly shaped fieldstone. That was the characteristic masonry style of Price County's German settlers. Finnish settlers in the area preferred a "smaller, clean-cut" style with carefully squared rubble masonry and uniformly blocked voussoirs.[19]

There are eight fieldstone country bridges in Waupaca County built between 1900 and 1908. Common features include one to three arches, long approaches, pipe-metal railings and split-fieldstone voussoirs. These bridges display a more finished appearance because they use smaller, matched, rounded fieldstone which is also evident in other Waupaca buildings.[20]

The final category of regional country bridges includes the fourteen limestone structures in Outagamie, Calumet, Brown and Fond du Lac Counties. These structures date from 1900 to 1909, and they have from one to nine arches. Their features include "heavily-mortared, rock-faced, rubble-masonry construction with bedding planes from 4 to 9 inches thick, which matches the region's thin-bedded limestone." Up close, the limestone gives these bridges a rough appearance; however, at a distance they have a "sophisticated" and "aesthetically-pleasing" effect. Exhibiting a Roman profile, the Palm Tree Road Bridge in Fond du Lac County is a fine example of a country limestone bridge. With nine arches, it has the largest number of spans among extant stone-arch bridges in Wisconsin.[21]

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[18]Ibid., 35-36.

[19]Ibid., 35-51.

[20]Ibid., 51-58.

[21]Ibid., 58-61.

The eight city stone-arch bridges were built between 1881 and 1913 and are scattered across seven counties. The construction of these bridges involved considerably more sophisticated engineering than the country bridges because they handled heavier traffic. Since they were more visible, city bridges utilized more elaborate ornamentation as a means to display civic pride. Aside from the ornamentation, these bridges often featured pedestrian walkways and had a minimum width of thirty feet. They included from one to six arches and used one of the four major types of building material. The finest example of the state's stone-arch city bridges is Merrill's First Street Bridge. Its three segmental arches each span thirty-seven feet, the longest stone-arch highway spans in Wisconsin.[22]

The Waupaca River Bridge is a six-span, stone-arch structure. It was built in a city and county well known for their stone-arch bridges.

THE WAUPACA RIVER BRIDGE

The history of the Waupaca River Bridge is closely tied to the commercial and industrial development of Waupaca. Indeed, the Waupaca River Bridge literally served as a link between some of the city's historically significant businesses. In the nineteenth century, these included the new City Mills and later the A. G. Nelson & Company on the east side of the river and the Waupaca Star Mills on the west. Since before the turn of the century, the City Water Works Station No. 1 has been located on the bridge's western end [see HAER No. WI-70-A].[23]

The Waupaca River Bridge was built in 1891. It was preceded by a wooden structure. None of the histories of Waupaca indicate when this bridge was built; however, an 1871 map of Waupaca clearly shows a bridge across the river at Mill Street. At that time, the Waupaca Star Mills and the new City Mills were located on the west and east ends respectively. By January 1891, the wooden bridge had deteriorated to the point that several aldermen pressed for the construction of a new stone bridge. Stone was considered most preferable because it was locally abundant.[24]

The city council formed a committee on streets and bridges which reported in May 1891 on the "dilapidated condition of [the] Mill Street bridge."[25] The council agreed to solicit plans and specifications for a new bridge. This call was enthusiastically received as many engineering firms "besieged" the

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[22]Ibid., 69-79. Note that a full discussion on stone arch bridges in Wisconsin can be found in Historic Highway Bridges of Wisconsin, Volume 1.

[23]Ware, A Standard History of Waupaca County, 252-53; Athan, Technological Watersheds, 23.

[24]Th. M. Fowler & Co., Map of Waupaca, Wisconsin, 1871; Sanborn Map & Publishing Co., Map of Waupaca, Wisconsin, 1885; Waupaca County Republican, 9 January 1891, 5.

[25]Although the name "Mill Street Bridge" is used, the reference is to the Waupaca River Bridge.

committee before the 16 June deadline. Indeed, the committee examined seven plans for iron bridges and one for a stone bridge. The committee, "after careful examination of both," determined that a stone bridge was most desirable because "it can be done for the same or less cost than any other kind and also a large majority of the citizens are in favor of that kind...."[26] On 19 June, F. Machin, chairman of the bridge committee, announced that sealed bids would be received for the project. Bids were due no later than 25 June 1891. C.J. Doty & Co. submitted a bid for $5,000; Smith & Baldwin's bid was for $2,575. The project was awarded to Mads. Rasmussen, a local contractor, who tendered a low bid of $2,500. The contract specified the construction of a six-arch stone bridge to be completed by 1 September.[27]

Work began in early July when the old wooden bridge was torn down. The Waupaca County Republican noted that the public would have to find alternate routes across the river, such as the bridge near the schoolhouse (State Street) or the old footbridge. The paper rationalized the bother because "the fact of having a permanent, substantial and lasting bridge, will compensate for all inconvenience." The city accommodated pedestrians by having a temporary walkway built across the river.[28]

By late July, work on the bridge was well underway. Rasmussen had the foundations ready for the arches and the forms for the arch supports were near completion. As well, twenty car-loads of limestone from a quarry in nearby Dale began arriving at that time. By late August, four of the six arches were nearly finished. The Waupaca County Republican boasted that the structure would be "undoubtedly the largest stone bridge in the state, it being one hundred and twenty-three feet long (ten feet longer than the plans and specifications call for)...."[29] All six arches and the side masonry railing were completed by 11 September. Remaining work included only bolts, coping and fill work (which was done by the city). When just the completion of the iron railing remained, horse teams began crossing the bridge in mid-September. A few months after it opened, the stone-arch bridge proved its durability by surviving a November fire near the A.G. Nelson planing mill; a wooden bridge would certainly have been destroyed in the blaze.[30]

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[26]Common Council of the City of Waupaca, "Proceedings of the Common Council of the City of Waupaca, 16 June 1891" (Waupaca: n.p., 1886-1892), 451-52.

[27]Waupaca County Republican, 22 May 1891, 5; 12 June 1891, 5; 19 June 1891, 5; 3 July 1891, 5; Waupaca Post, 2 July 1891, 3.

[28]Waupaca County Republican, 10 July 1891, 5; 24 July 1891, 5.

[29]Waupaca County Republican, 24 July 1891, 5; 21 August 1891, 5. Note: WisDOT Intensive Survey Form lists the length of the bridge at 165 feet.

[30]Waupaca County Republican, 11 September 1891, 5; 18 September 1891, 5; 13 November 1891, 5; Waupaca Post, 5 November 1891, 3.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural Character: The Waupaca River/Mill Street Bridge was built in 1891. Although coated with gunite, it is a six-span, stone-arch bridge.

2. Condition of fabric: The historic fabric of this structure has been substantially compromised through the application of gunite. The form of the structure, however, appears to be good.

B. Description:

The length of this six-span, granite, stone-arch bridge is 165'-7", its width is 28'-7" and it carries two lanes of traffic. The 2' wide, segmental arches spring from short, 4'-2" wide piers with upstream cutwaters. The west arch is about 17'-3" wide, while its height is 8'-10". The measurements of the remaining five arches appear to be about the same.

The bridge walkway, located on the south side of the structure, is supported by fifteen metal brackets. Three, 3" x 8" stringers carry the 5'-5" wide deck, which itself is comprised of 344 2" x 6" planks.

Atop the bridge is a pipe railing. The railing along the walkway has 35" high, 3-1/8" uprights, a 1-3/4" top rail and two, 1-1/4" intermediate rails. The railing along the upstream side of the bridge, as well as that between the traffic deck and the walkway utilize 2-7/8" uprights, a 2-3/8" top rail and two, 1-7/8" intermediate rails. The rails are 46" and 43" high, respectively.

C. Setting:

The bridge is located in the City of Waupaca, at that point where Mill Street crosses the Waupaca River. At one time, mills were adjacent to either end of the bridge. Today, however, an old water pumping station, a city garage and a multiple family residential building are immediately west of the bridge, while an open, park-like area is to the east, with an industrial plant beyond that.

PART III. SOURCES OF INFORMATION

A. Bibliography:

1. Primary and unpublished sources:

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Waupaca County Republican, various dates.

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2. Secondary and published sources:

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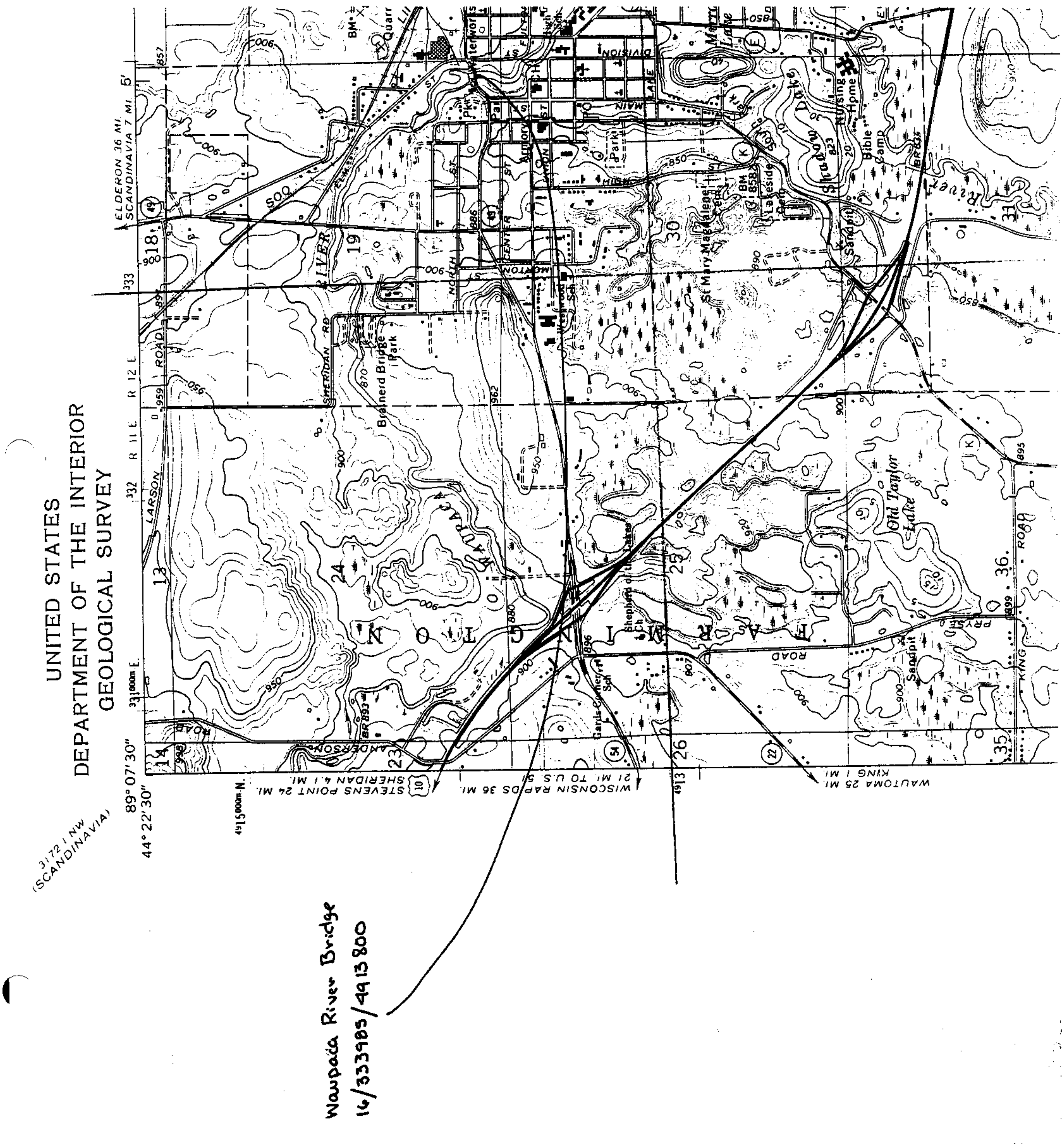
N89 W16785 Appleton Avenue
Menomonee Falls, Wisconsin
26 August 1993

PART IV. PROJECT INFORMATION

This project has been sponsored by the Wisconsin Department of Transportation. Ayres Associates, consulting engineers in Eau Claire, Wisconsin, formally acted as the contracting agency. The project was undertaken by Dr. John N. Vogel, Principal Investigator and Historian for Heritage Research, Ltd., who provided the photographic work, the architectural/technical data, and the context. Vogel was assisted in the research and preparation of this material by Kevin Abing and Laura Abing, Heritage Research Assistant Historians.


UNITED STATES
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WAUTOMA 25 MI.
KING 1 MI.
Old Taylor Lake
Shadow Lake
Brainerd Bridge Park
Bible Camp
Nursing Home
St Mary Magdalene Cem
Waupaca River Bridge
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